

FCC Test Report

Product Name	Wireless Gaming Mouse
Model No.	P708
FCC ID.	H4IMSP708

Applicant	Lite-on Technology Corp.
Address	16F,392,Ruey Kuang Road,Neihu ,11492 Taipei, Taiwan

Date of Receipt	Dec. 06, 2021
Issued Date	Feb. 22, 2022
Report No.	21C0224R-RFUSOTHV02-A
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

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Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report

Issued Date: Feb. 22, 2022

Report No.: 21C0224R-RFUSOTHV02-A



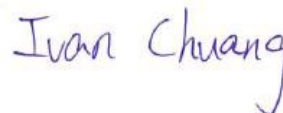
Product Name	Wireless Gaming Mouse
Applicant	Lite-on Technology Corp.
Address	16F,392,Ruey Kuang Road,Neihu ,11492 Taipei, Taiwan
Manufacturer	Lite-on Technology Corp.
Model No.	P708
FCC ID.	H4IMSP708
EUT Rated Voltage	DC 5V (Power by USB) or DC 3.7V (Power by Battery)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Project Specialist / Joanne Lin)

Tested By :



(Senior Engineer / Ivan Chuang)

Approved By :



(Senior Engineer / Alan Chen)

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Revision History

Report No.	Version	Description	Issued Date
21C0224R-RFUSOTHV02-A	V1.0	Initial issue of report.	2022-02-22

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Gaming Mouse
Trade Name	ASUS
Model No.	P708
FCC ID.	H4IMSP708
Frequency Range	111-200kHz
Type of Modulation	ASK Modulation
Type of antenna	Coil Antenna
Type A to Type C Cable	MFR: ASUS, M/N: P708, Shielded, 2m
Type C to Type A Extender	MFR: ASUS, M/N: P708

Frequency of Channel:

Channel	Frequency
Channel 1:	128kHz

Note:

1. The EUT is a Wireless Gaming Mouse with a built-in 111-200kHz transceiver.
2. Only the worst case is shown in the report.
3. The P708 only receiver.
4. The test fixture is WPT transmitter, FCC ID: K7SWIA002.
5. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.209.

Test Mode	Mode 1: Transmit
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1.2. Test System Details

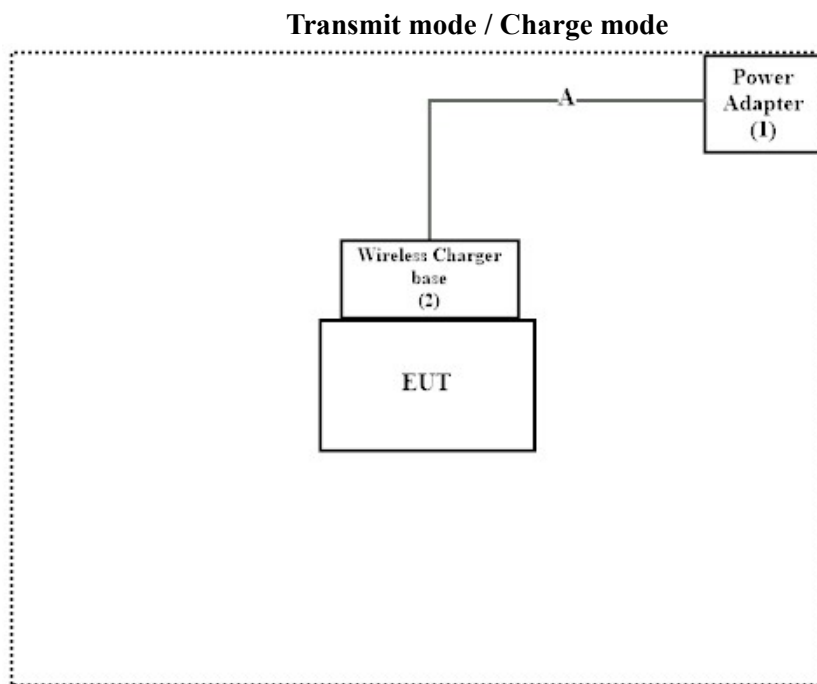
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Transmit mode / Charge mode

Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Power Adapter	CHEN YANG ELECTRONICS	MDY-09-EB	N/A
2	Wireless Charger base	Belkin	WIA002	35G10F66BA05195

Signal Cable Type	Signal cable Description
A	Type A to Type C Cable
	Shielded, 2.0m

1.3. Configuration of Test System



1.4. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.3.
- (2) Turn on the power of all equipment.
- (3) Start the continuous receiver.
- (4) Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23.5 °C
	Humidity (%RH)	10~90 %	49.6 %
Radiated Emission	Temperature (°C)	10~40 °C	21.2 °C
	Humidity (%RH)	10~90 %	61.5 %

USA : **FCC Registration Number: TW0033**

Canada : **IC Registration Number: 26930**

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan
Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone number : +886-3-275-7255
Fax number : +866-3-327-8031
Email address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Equipment

For Conduction measurements / SH1

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	EMI Test Receiver	R&S	ESR7	101601	2021/06/19	2022/06/18
X	Two-Line V-Network	R&S	ENV216	101306	2021/04/08	2022/04/07
X	Two-Line V-Network	R&S	ENV216	101307	2021/05/04	2022/05/03
X	Coaxial Cable	DEKRA	RG400 BNC	RF001	2021/05/24	2022/05/23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : AUDIX e3 V9.

For Radiated measurements / 966-3

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due. Date
X	Loop Antenna	AMETEK	HLA6121	56736	2021/04/14	2022/04/13
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2022/08/10
	Horn Antenna	ETS-Lindgren	3117	00227700	2021/10/12	2022/10/11
	Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2022/10/03
	Pre-Amplifier	SGH	EM330	60736	2021/08/11	2022/08/10
X	Pre-Amplifier	SGH	PRAMP118	20200202	2021/03/25	2022/03/24
X	Pre-Amplifier	EMCI	EMC001330	980254	2021/07/06	2022/07/05
	Pre-Amplifier	EMCI	EMC051835SE	980313	2021/11/24	2022/11/23
	Pre-Amplifier	EMCI	EMC05820SE	980309	2021/09/27	2022/09/26
	Pre-Amplifier	EMCI	EMC05820SE	980310	2021/07/07	2022/07/06
	Pre-Amplifier	EMCI	EMC184045SE	980369	2021/04/27	2022/04/26
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
	Filter	MICRO TRONICS	BRM50702	G251	2021/09/16	2022/09/15
	Filter	MICRO TRONICS	BRM50716	G188	2021/09/16	2022/09/15
X	EMI Test	R&S	ESR3	102793	2021/12/15	2022/12/14
X	Spectrum	R&S	FSV3044	101114	2021/02/04	2022/02/03
X	Coaxial Cable	SGH	HA800	GD20110222-3	2021/03/05	2022/03/04
	Coaxial Cable	SGH	SGH18	20110223-1		
	Coaxial Cable	SGH	SGH18	2021001-1		
	Coaxial Cable	SGH	SGH18	2021001-18		

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with "X" are used to measure the final test results.
3. Test Software version : AUDIX e3 V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.

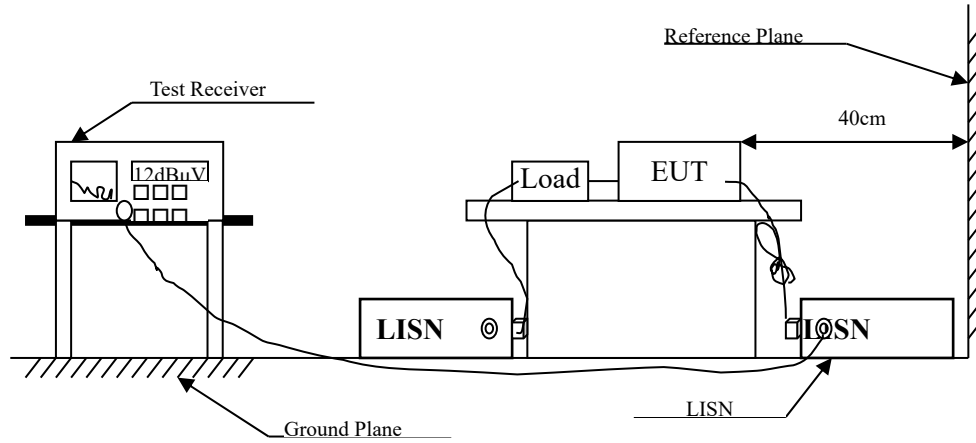
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1GHz ± 4.06 dB	Above 1GHz ± 3.73 dB

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dB μ V) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56 _(註)	56-46 _(註)
0.50-5.0	56	46
5.0 - 30	60	50

2.3. Test Procedure

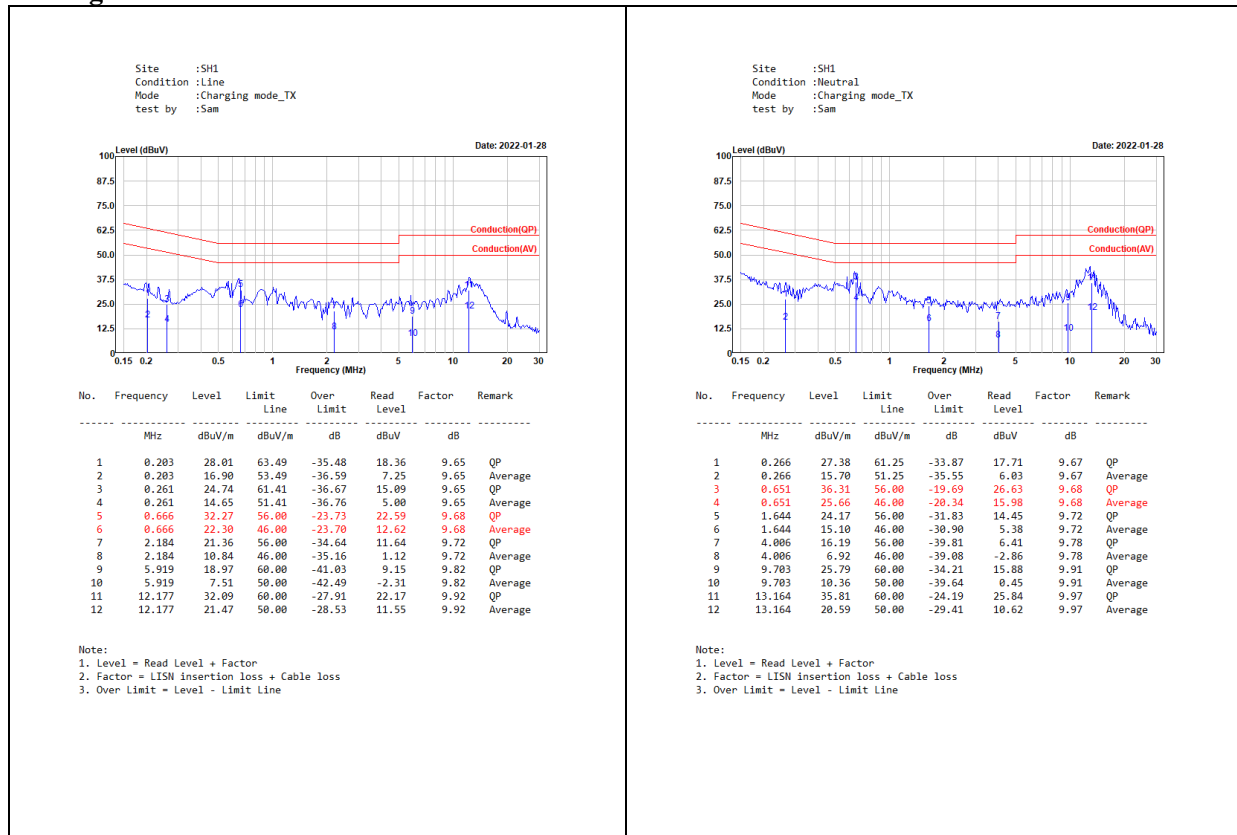
The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.4. Test Result of Conducted Emission

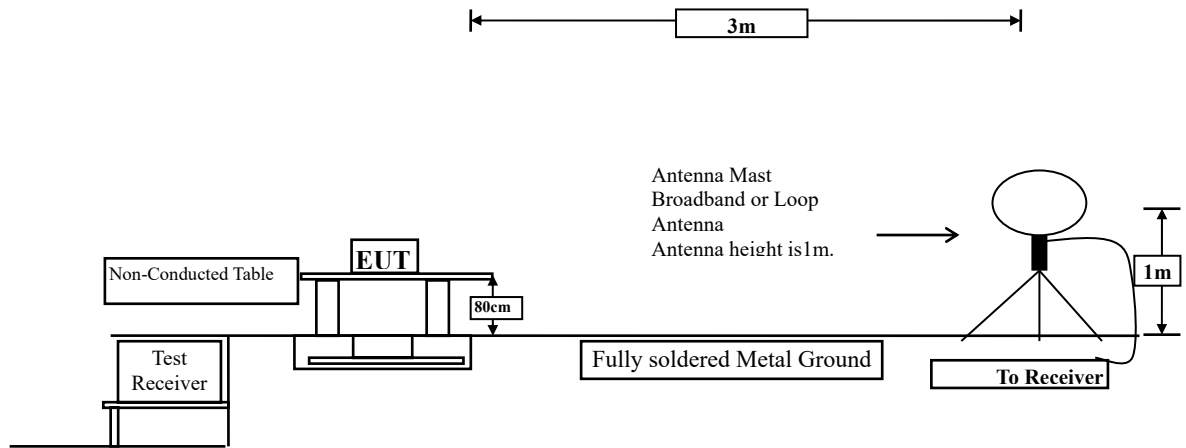
Charge mode



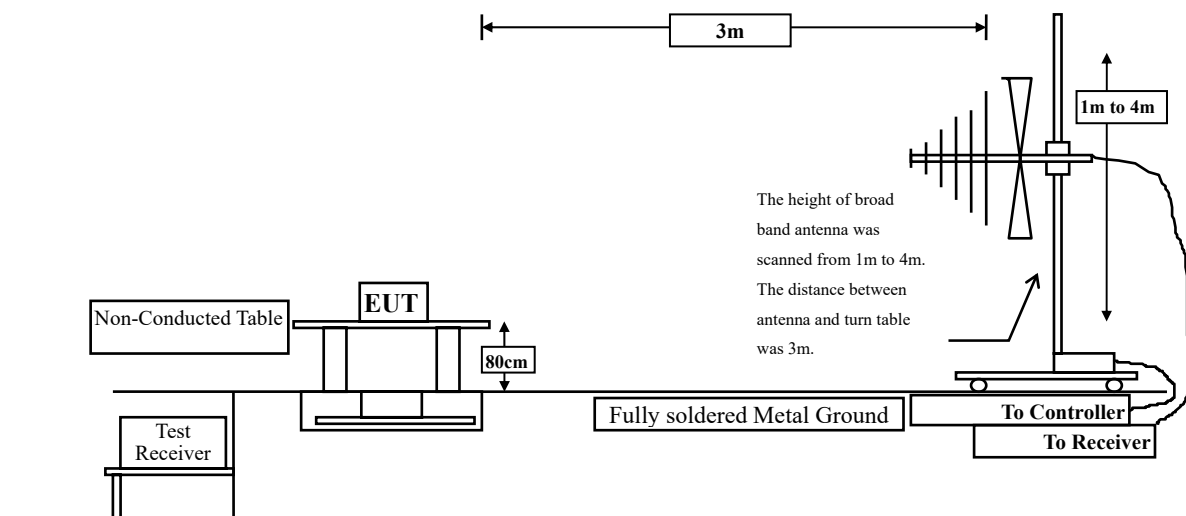
3. Radiated Emission

3.1. Test Setup

Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



3.2. Limits

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks :

1. RF Voltage (dB μ V) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.209 requirements.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz. Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

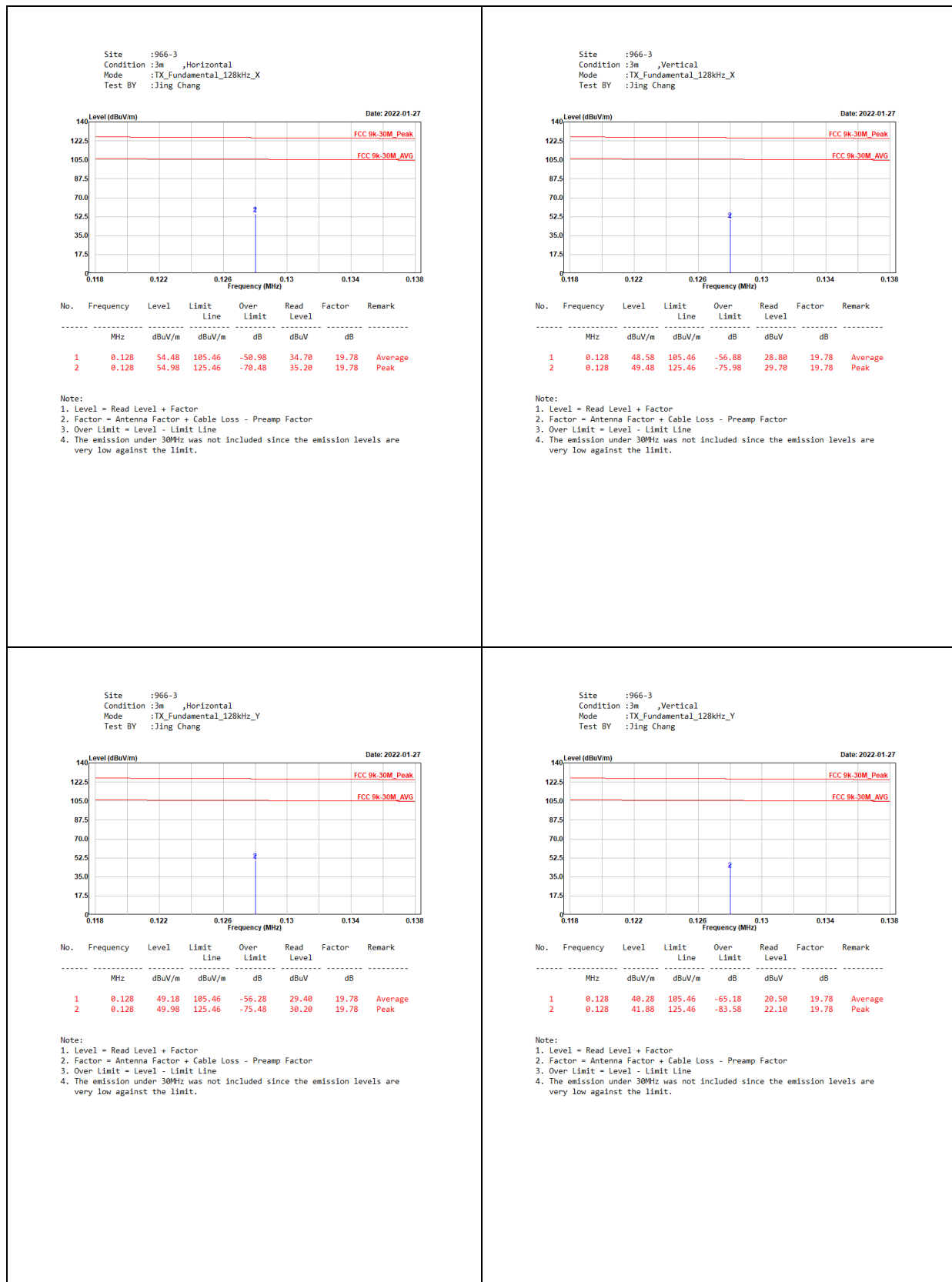
The measurement is divided into the Preliminary Measurement and the Final Measurement.

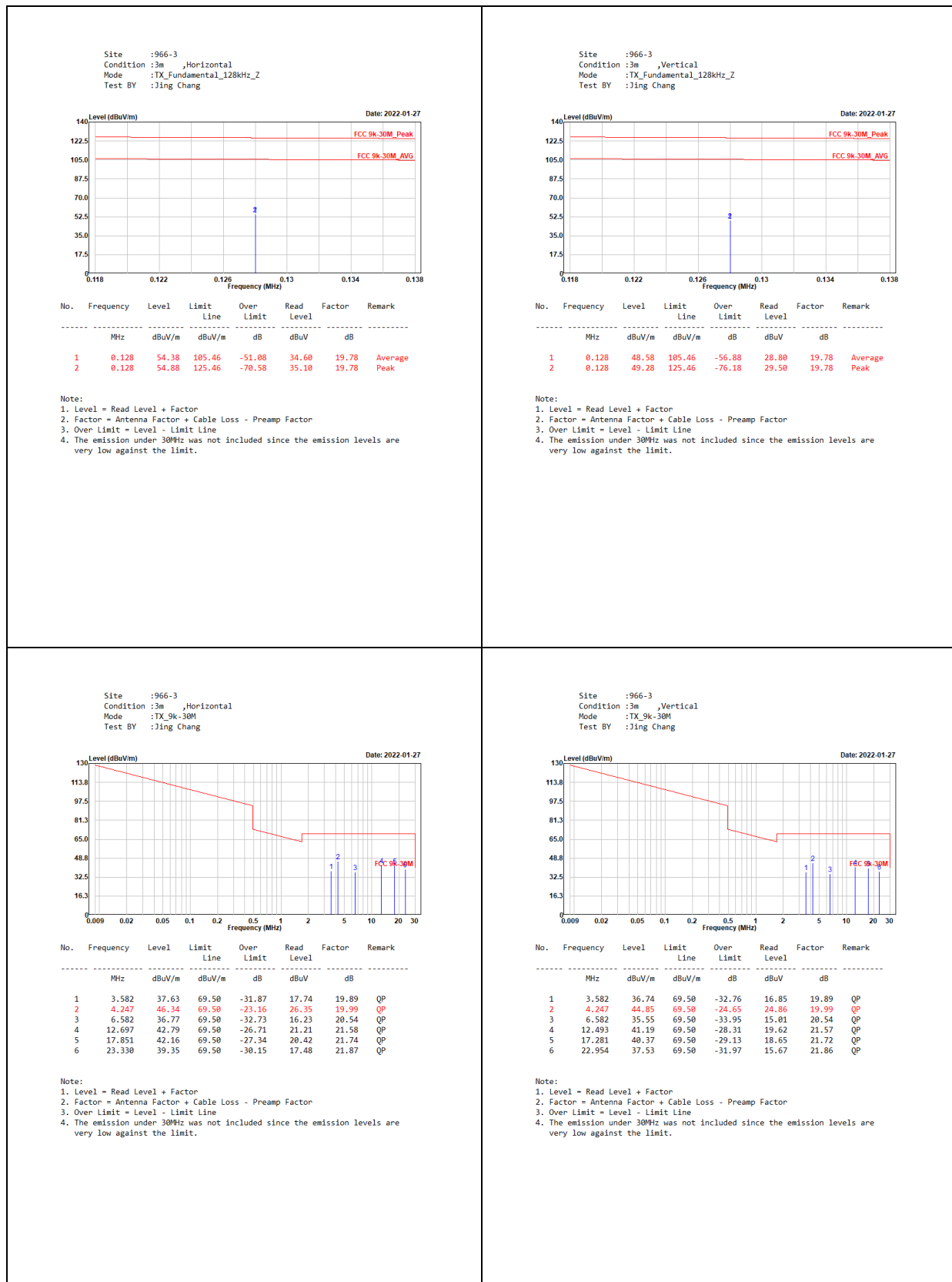
The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

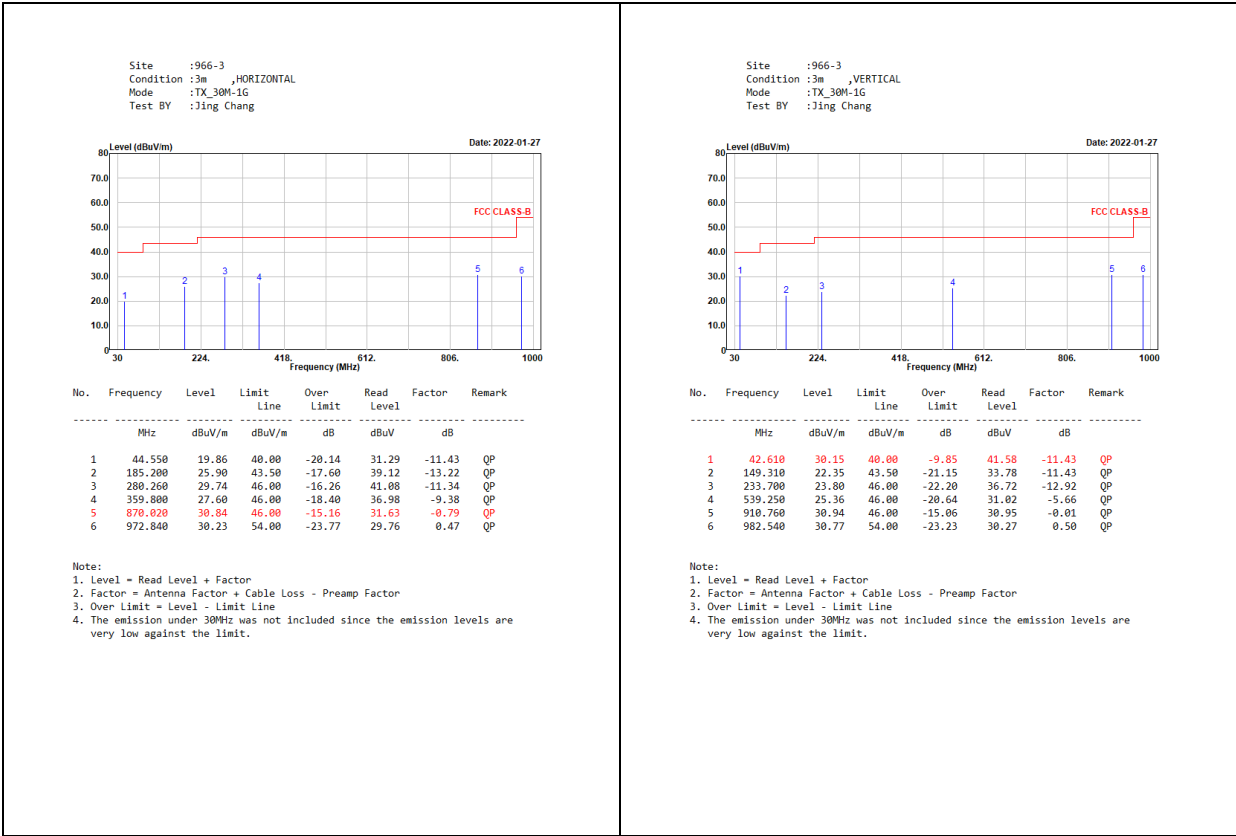
The worst radiated emission is measured on the Final Measurement.

The measurement frequency range from 9kHz - 10th Harmonic of fundamental was investigated.

3.4. Test Result of Radiated Emission







4. EMI Reduction Method During Compliance Testing

No modification was made during testing.